

REMARKS

This paper is being submitted in response to the Office Action mailed September 26, 2003, for the above-referenced application. In this response, Applicant has amended claims 1 and 13 to clarify that which Applicant regards as the invention. Applicant respectfully submits that the amendments to the claims are fully supported by the originally-filed specification.

The rejection of claims 1, 2, 5-7, 9, 12, 14, 15, 17 and 20 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,389,046 to Stayt, Jr. et al. (hereinafter "Stayt") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 1, as amended herein, recites a wavelength stabilized laser module. The module includes a semiconductor laser and a temperature calibrating unit to calibrate a temperature of the laser. Only one lens arranges light emitted from said semiconductor laser to a single parallel luminous flux. A first photoelectric converting unit receives one part of the parallel luminous flux and converts it to a first electric signal. A filter receives another part of the parallel luminous flux and continuously changes its transmittance depending on wavelengths of the light. A second photoelectric converting unit receives light transmitted through the filter and converts it to a second electric signal, wherein a control signal, to be used for stabilization of wavelengths, obtained by computations of the first and second electric signals, is fed back to the laser and/or the temperature calibrating unit so that the laser is able to stably emit laser light having a reference wavelength to be used as a target for stabilization of wavelengths. Claims 2-12, 14, 15, 17, 18, and 19-22 depend on independent claim 1.

The Stayt reference discloses that a discriminator 300 (or 301) generates a pair of ideally equi-power optical beams 400, 500, a pair of collimating lenses 410, 510 to produce a pair of substantially parallel, collimated light beams 420, 520. (See Figure 1 and col. 5, line 67 to col. 6, line 5 of Stayt). Further, Stayt discloses that discriminator 300 may be an interferometer of the etalon, Mach-Zender or Fabry-Perot type, a high-pass filter, a low-pass filter, a band-pass filter, or an interference filter, which generates a pair of optical beams of equal wavelength. (See Figure 4, and col. 7, lines 16-20 of Stayt).

Applicant's independent claims all recite a wavelength stabilized laser module that includes at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux* in combination with the other features as recited. Applicant's invention utilizes a single parallel luminous flux that can be arranged from a single lens that receives light emitted from the semiconductor laser and is further processed by the other elements as recited in Applicant's claims. The result of Applicant's invention is a wavelength stabilized laser module having a small component count and being compact enough to be housed in a tightly-spaced case and being capable of setting a reference wavelength easily with high accuracy and being manufactured at low cost. (See, for example, page 14, lines 11-27 of the present application).

Stayt discloses a discriminator element designed to generate a pair of optical beams of equal wavelength. The Office Action compares the discriminator as a whole to a lens, but Applicant respectfully submits that Stayt's need to generate a pair of optical beams of equal

wavelength requires that components other than one lens be used. For this reason, it is inaccurate to refer to the discriminator as a lens, in that Stayt's discriminator is different from a lens in its functional configuration. Stayt specifies potential components of his discriminator including an interferometer of the etalon or Mach-Zender or Fabry-Perot type, a high-pass filter, a low-pass filter, a band-pass filter or an interference filter. (See col. 7, lines 16-20 of Stayt). These discriminator components are suggested by Stayt for the function of generating a pair of optical beams of equal wavelength. A single lens is incapable of performing this function.

Applicant has clarified the independent claims of the present application to specify that only one lens is used to arrange light emitted from the semiconductor lens as a single parallel luminous flux. Applicant respectfully submits that a single lens cannot be used in Stayt's discriminator to perform the required function. Applicant's single lens is used for a different function than Stayt's discriminator, namely, Applicant's single lens is used to arrange a single parallel luminous flux and not to generate a pair of optical beams of equal wavelength as disclosed by Stayt. *Applicant recites a different element that performs a different function as compared with the system disclosed by Stayt.* Applicant respectfully submits that Stayt does not teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over Stayt is hereby traversed and reconsideration is respectfully requested in view of the amendments to the

claims contained herein.

The features of independent claim 1 are discussed above. Claim 4 depends thereon.

As noted above, Applicant respectfully submits that Stayt does not teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 8 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 6,018,536 to Alphonse (hereinafter "Alphonse") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of claim 1 are discussed above. Claim 8 depends thereon.

The Alphonse reference discloses a laser that produces light having multiple wavelengths. The laser includes a gain medium disposed within the laser resonance cavity, a dispersion element coupled to the gain medium and within the laser resonance cavity, and a wavelengths-elective element having non-abutting reflective segments.

Applicant respectfully submits that Alphonse does not overcome the above-noted

deficiencies of the Stayt reference with respect to Applicant's claims. Applicant respectfully submits that neither Alphonse nor Stayt, taken alone or in combination, teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 10 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of Alphonse is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claim 1 are discussed above. Claim 10 depends thereon.

Applicant respectfully submits that Alphonse does not overcome the above-noted deficiencies of the Stayt reference with respect to Applicant's claims. Applicant respectfully submits that neither Alphonse nor Stayt, taken alone or in combination, teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 13 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 5,025,449 to Yamamoto et al. (hereinafter "Yamamoto") is hereby

traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 13, as amended herein, recites a wavelength stabilized laser module. The module includes a semiconductor laser and a temperature calibrating unit to calibrate a temperature of the laser. Only one lens arranges light emitted from said semiconductor laser to a single parallel luminous flux. A first photoelectric converting unit receives one part of the parallel luminous flux and converts it to a first electric signal. A filter receives another part of the parallel luminous flux and continuously changes its transmittance depending on wavelengths of the light. A second photoelectric converting unit receives light transmitted through the filter and converts it to a second electric signal, wherein a control signal, to be used for stabilization of wavelengths, obtained by computations of the first and second electric signals, is fed back to the laser and/or the temperature calibrating unit so that the laser is able to stably emit laser light having a reference wavelength to be used as a target for stabilization of wavelengths. Further, the filter is fixed to the second photoelectric converting unit.

The Yamamoto reference discloses an optical pumping-type solid-state laser apparatus with a semiconductor laser device. The Office Action cites Yamamoto as disclosing a filter that is fixed to a second photoelectric converting unit.

Applicant respectfully submits that Yamamoto does not overcome the above-noted deficiencies of the Stayt reference with respect to Applicant's claims. Applicant respectfully submits that neither Yamamoto nor Stayt, taken alone or in combination, teach or fairly suggest a

wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claims 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 5,446,750 to Ohtsuka et al. (hereinafter "Ohtsuka") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claim 1 are discussed above. Claims 18 and 19 depend thereon.

The Ohtsuka reference discloses a laser diode pumped solid laser having an optical module with a laser diode, a solid laser crystal, which is excited by a beam generated by the laser diode, and a resonator. An electronic cooling device has a cooling surface, on which the optical module is placed, and a heat radiating surface.

Applicant respectfully submits that Ohtsuka does not overcome the above-noted deficiencies of the Stayt reference with respect to Applicant's claims. Applicant respectfully submits that neither Ohtsuka nor Stayt, taken alone or in combination, teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination

with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claims 21-22 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 6,233,263 to Chang-Hasnain et al. (hereinafter "Chang-Hasnain") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

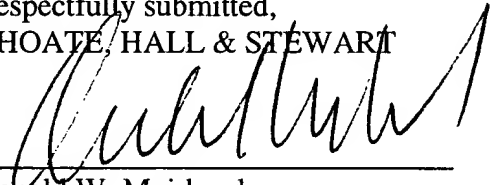
The features of independent claim 1 are discussed above. Claims 21 and 22 depend thereon.

The Chang-Hasnain reference discloses a monitoring and control assembly for an optical system that includes a tunable laser. The laser is disclosed as generating a divergent output beam along an optical axis.

Applicant respectfully submits that Chang-Hasnain does not overcome the above-noted deficiencies of the Stayt reference with respect to Applicant's claims. Applicant respectfully submits that neither Chang-Hasnain nor Stayt, taken alone or in combination, teach or fairly suggest a wavelength stabilized laser module having at least the feature of *only one lens to arrange light emitted from said semiconductor laser so as to be a single parallel luminous flux*, in combination with the other features as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Based on the above, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
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